

A  
BRIEF TREATISE  
OF THE VSE OF THE  
Globe Celestiall and  
Terrestriall:

WHEREIN IS SET DOWNE  
the principles of the Mathematicks, fit  
for all trauellers, Nauigators, and  
all others that doe loue the  
knowledge of the  
same Art.

By R. T.



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*Thomas Man. 1616.*

A

# BRIEF TREATISE

OF THE USE OF THE

TOBACCO PIPE AND

SMOKING

WHICH IS SET DOWN

FOR THE USE OF THE

SMOKERS OF THE

TOBACCO PIPE

AND

SMOKING

W. H. H.



NEW YORK

1850

W. H. H.



## THE PREFACE TO the Reader.

**I** Doe here present thee (gentle Reader) with a brieſe collection of the uſe of the Globe, which may ſerue for an introduction to young Students in the Mathematickes, requiring thee to accept thereof: for I doubt not it will be very good for the furtherance of travellers in the Art of Navigation: and to all others that are deſirous of the knowledge of the beautifull frame of the celeftiall Orbs, with their quantities, diſtances, courſes, and marvellous motions of the Globes of the Sunne, Moone, Planets and fixed ſtarres. If therefore this my labour ſhall be gratefully accepted, as I doubt not but it ſhall, if thou pleaſe inſly to cenſure thereof: I ſhall be encouraged hereafter to ſet forth a worke

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of





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# INTRODV- CTION TO Astronomy.

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## *Definitions of the Globe.*

**T**HE Globe is a perfect round bodie, contained vnder one plaine: in the middle thereof there is a poynt called the Cēter, from whence all lines drawne to the outside are of like length, and called Semi-diameters.

The axes of the Globe is a diameter, about which it moueth; and the ends thereof are called the poles of the Globe.

In this respect the frame of the heauens is called the Globe of the heauens, and the earth his Center.

The axes is a line imagined, passing by the

the Center of the earth to the heavens, and the ends thereof is called the poles, which are two points imagined in the heavens, whereof the one is called the North pole, and the other the South pole.

*Of the Circles of the Globe.*

Circles of the Globe are certaine imaginarie lines, and are termed either lesser, or greater Circles.

Greater Circles are such as diuideth the Globe into two equall parts.

Lesser are such as diuide the Globe into vnequall parts.

Greater Circles of the Globe in common account are sixe in number, viz.

The	{	Horizon.
		Meridian.
		Equinoctiall.
		Zodiacke.
		Two Collures.

Lesser Circles in common account are foure in number, viz.

The	{	Two Tropicks.
		Two poler Circles.

The Horizon diuideth that part of the heavens

heavens we doe see, from that part wee see not, and is that Circle, where standing in a plaine field, and looking about, you would imagine the earth and heavens doe meete together, and cannot be perfectly discerned but at sea.

The axes of the Horizon, is an imagined line, passing by the Center of the earth to the heavens, and the ends thereof, are called the poles *Zenith* and *Nadir*.

The *Zenith* is the point direct over our heads, and the *Nadir* direct vnder our feet.

As a man moueth himselfe any way, so is altered the Horizon.

The Meridian cutteth the Horizon at right sphericall angles, and passeth by the poles of heaven, and by the *Zenith* and *Nadir*, and is that Circle wherein the ☉ is at noone, and at midnight: it diuideth the Globe into two equall parts by East and West, whose axes is a line passing by the Center of the earth to the heavens, and the ends thereof the poles, which are the two points of the intersection of the East and West.

Any man mouing directly North and South, keepeth the same Meridian: but going East or West, he altereth the same.

The

The Equinoctiall cutteth the Meridian at right sphericall angles, and lieth equidistant betwixt each poles, and diuideth the Globe into two equall parts, by North and South parts, to which Circle when the ☉ commeth vnder it, it maketh the day and night of like length to all people in the world, except vnder the poles, and the ☉ commeth vnder this Circle two daies in the yeere, viz. the 11. of March, and on the 14. of September.

The axes and poles whereof are the axes and poles of heauen.

The Zodiack is a great Circle, hauing in breadth twelue degrees, which breadth is limited for the wandring of planers, vpon which Circle are the twelue signes placed, which are twelue Constellations.

A Constellation is any certaine number of stars, gathered together into one forme by the ancient Astronomers, who haue giuen them names, whereby they are knowne to all Christendome: which signes haue certaine characters giuen vnto them, and are these following.

*1. March.*

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1 March.	Northern signes.	1 Aries.	♈
2 Aprill.		2 Taurus.	♉
3 May.		3 Gemini.	♊
4 Iune.		4 Cancer.	♋
5 Iuly.		5 Leo.	♌
6 August.		6 Virgo.	♍

7 Septemb.	Southern signes.	7 Libra.	♎
8 October.		8 Scorpio.	♏
9 November.		9 Sagittarius.	♐
10 Decemb.		10 Capricornus.	♑
11 Iannary.		11 Aquarius.	♒
12 February.		12 Pisces.	♓

The first sixe are called Northern signes, for that they are placed vpon the North side of the equinoctiall; and the last sixe are called Southerne signes, for that they are placed vpon the South side of the equinoctiall.

In the middle of the Zodiacke is a line called the ecliptick, from which line the Center of the ☉ neuer swarueeth, and this line cutteth the equinoctiall at oblique angles, and swarueeth from it 23 degrees 30 minutes: which line when the ☉ and ☾ are in a diameter, that is, opposite, then is the ☾ eclipsed, that is, darkned by the shadow

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dow of the earth, the earth being betwixt the ☉ and the ☾.

And when the ☉ and ☾ are both vnder the line in a semidiameter, then is the ☉ eclipsed, the ☾ being interposed betwixt our sight and the ☉: this line eclipcticke is described vpon the Globe for the whole Zodiack, whose axe is a line passing by the Center of the earth to the heavens, and the ends thereof are his poles, which are two points so farre distant from the poles of the world, as the ☉ his greatest distance from the equinoctiall, viz. 23 degrees 30 min.

The two Collures are two meridians cutting the equinoctiall, and the eclipcticke into foure equall parts, the one passing by the first point of ♈ and ♎, and is called the equinoctiall Collure. The other passing by the first point of ♊ and ♋, and is called the solstitiall Collure: these two Circles do diuide the yeere in foure equall parts, viz. Spring-time, Sommer, Haruest, and Winter.

1 ♈	} Spring-time.	4 ☊	} Sommer.
2 ♉		5 ♋	
3 ♊		6 ♌	

7 $\overline{\text{m}}$	} Haruest.	10 $\text{yo}$	} Winter.
8 $\text{m}$		11 $\text{w}$	
9 $\ddagger$		12 $\text{x}$	

The meaning wherof is thus: From that time the  $\odot$  entreth into  $\text{v}$ , till it enter into  $\text{♋}$ , is called Spring-time, and so of the rest, so that it is the passage of the  $\odot$  in the signes, that causeth the alteration of season, and the  $\odot$  passeth thoroughout the whole signes in one yeere, viz. in 365 daies and 6 houres neere.

*Of the lesser Circle.*

**T**He Tropick of  $\text{♋}$  is a Circle parallel to the equinoctiall 23 degrees 30 min. distant frō it, Northward, and is that Circle vnder which the Center of the  $\odot$  maketh her diagonall arke, when she is in the first point of  $\text{♋}$ , which is to vs that haue Northern Latitude, the longest day in the yeere being the 12 or 13 of Iune.

The Tropick of  $\text{yo}$  is a Circle parallel to the equinoctiall, so farre to the Southward, as the Tropick of  $\text{♋}$  is Northward, viz. 23 degrees 30 min. and is that Circle vnder which the Center of the  $\odot$  maketh her

her diagonall arke, when she is in the first point of ♊, which to vs that haue Northern Latitude, is the shortest day in winter, viz. the 12. or 13. of December. These two Circles are termed the limit of the ☉ progresse: for betweene these two Circles the ☉ hath his continuall course, and neuer exceedeth beyond any of them.

The Circle arcticke is a Circle parallel to the equinoctiall, so farre distant from the North pole, as the tropicke of Cancer is from the equinoctiall, viz. 23. degr. 30. min.

The Circle antarcticke is a Circle parallel to the equinoctiall so farre distant from the South pole, as the tropick of ♊ is from the equinoctiall, viz. 23. degr. 30. min.

Now you must vnderstand, there is but one Equinoctiall, one Zodiacke, one Ecliptick, two Collures.

But there are diuers Meridians, al which meete in the two poles of the world, and cut the equinoctiall at right angles, and are so many in number as there can be points imagined in the equinoctiall.

There are diuers Horizons: for the Horizon altereth to any man, according as he moueth himselfe from his place of being.

There are diuers Parallels, so called for  
that



that they are parallel to the equinoctiall, and are so many in number, as there can be points imagined in the Meridian.

Besides these Circles, before mentioned, there are foure other kinde of Circles of great vse, *viz.* Azimoth and Almicanthars, Circles of Longitude and Latitude.

Azimoths are great Circles, and meete all in the Zenith, and Nadir, and cut the Horizon at right angles, and are numbred in the Horizon.

Almicanthars are lesser Circles parallel to the Horizon, as the parallels are to the equinoctiall, and are numbred from the Horizon towards the Zenith.

Circles of Longitude are great Circles, meeting all in the poles of the Eclipticke, and cut the Eclipticke at right angles, and are numbred in the Ecliptick.

Circles of Latitude are lesser Circles parallel to the Ecliptick, as the parallels are to the equinoctiall, and are numbred from the Eclipticke, to the poles of the Eclipticke.

Euery Circle of the Globe is imagined to be diuided into 360 degrees, and euery degree into 60. minutes, euery minute into 60 seconds, and so tell the tenth for the precisenes,

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cifenes, for that a degree in the heauens is a large space.

In euery great Circle the degrees are equall one to another.

In euery lesser Circle they are equall in the same Circle, but vnequall to those of another Circle, according as they grow neerer the poles.

There belongeth to the furnishing of a Globe two other things, that is, an houre Circle, with Index and a quadrant of Altitude.

The houre Circle is of brasse, diuided into 24. houres by twice 12, and is to be placed vpon the Meridian, vpon the pole eleuated parallel to the equinoctiall.

The Index is a little ruler to be put vpon the pole.

The quadrant of Altitude is a bowed ruler of brasse, diuided into 60. degrees, equal to the degrees of the Globe, and hath a ioint to fasten the same vpon the Meridian, and is alwaies to be placed vpon the Zenith.

For the practise of Astronomie & Cosmographie, there are two Globes made, the one of the Heauens, which is called the Celestiall globe, and the other of the Earth, which is called the Terrestriall globe.

Vpon

Vpon the Celestiall Globe are pictured al the starres vpon the Conuexitie thereof, as wee behold them in the heauens, in the Concauitie thereof in forme and distance.

Vpon the Globe of the earth is set sea and land, making one perfect body, all the knowne parts being laid downe in forme, proportion, and distance by scale, according to the proportion of the earth.

*Of the superficies of the Celestiall Globe.*

**T**O the intent that the knowledge of starres might bee brought in rule and memorie of men, therefore the ancient Astronomers gathered them together into certaine constellations; and gaue them names, whereby they are knowne vnto all the world, y haue the knowledge of letters.

A Constellation is a certaine number of starres gathered together in one forme, and so retaine their names, whereby they are particularly knowne, and are in number, according to the ancient account, 48. and are diuided into three parts, viz.

Northern	}	Constellations	}	21	The
Zodiake				12	
Southerne				15	

B

The Northern Constellations are 21. viz.

1	<i>Vrsa minor.</i>	7
2	<i>Vrsa maior.</i>	27
3	<i>Draco.</i>	31
4	<i>Cepheus.</i>	11
5	<i>Bootes or Arctophylax.</i>	22
6	<i>Corona Borealis.</i>	8
7	<i>Engonasmus aut Hercules.</i>	29
8	<i>Lyra.</i>	10
9	<i>Olor aut avis.</i>	17
10	<i>Cassiopea.</i>	13
11	<i>Persens.</i>	26
12	<i>Heniochus or Auriga.</i>	14
13	<i>Serpentarius.</i>	24
14	<i>Serpens.</i>	18
15	<i>Sagitta.</i>	5
16	<i>Aquila.</i>	9
17	<i>Delphinus.</i>	10
18	<i>Equulus light Horse.</i>	4
19	<i>Pegasus.</i>	20
20	<i>Andromeda.</i>	2
21	<i>Triangulus.</i>	4

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Zodiacke

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## Zodiacke Constellations

are 12, viz.

1	Aries.	13
2	Taurus.	23
3	Gemini.	18
4	Cancer.	9
5	Leo.	27
6	Virgo.	26
7	Libra.	8
8	Scorpius.	21
9	Sagittarius.	31
10	Capricornus.	28
11	Aquarius.	42
12	Pisces.	34
		<hr/> 280

## Southerne Constellations

are 15, viz.

1	Cetus.	22
2	Orion.	38
3	Flumen Eridanus.	34
4	Lupus.	12
5	Canis maior.	18
6	Canis minor vel Canicula.	2
7	Argo navis.	41
8	Hydra.	25
9	Crater.	7
10	Cernus.	7
11	Centaurus.	37
12	Fera aut Lupus.	19
13	Ara vel altar.	7
14	Corona austrina vel meridian.	13
15	Piscis notius.	11
		<hr/>

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Besides these there are 120. starres that are exempt out of all the Constellations, so that the number of stars set vpon the Globe are 1025, and diuers of them haue proper names, which I here omit.

You must vnderstand that all the starres in heauen are not numbred, nor cannot, for that diuers of them are so small, but these 2025 are the principallest amongst them, and all that haue yet euer been accounted of.

You must vnderstand, that of these stars some are greater then other, and are distinguished in sixe sorts of bignes, and their measures is the earth, and their proportions are thus deliuered, *vix.*

A starre of the first bignes is 107. times bigger then the earth.

A starre of the second bignes is 90. times the globe of the earth.

A starre of the third bignes is 72 times the globe of the earth.

A starre of the fourth bignes is 54 times the globe of the earth.

A starre of the fifth bignes is 36 times the globe of the earth.

A starre of the sixth bignes is 18 times the globe of the earth.

Starres

Stars mag- nitude,	{ 1	15	} In all 1025
	2	45	
	3 and the quan-	208	
	4 titie of each	474	
	5 magnitude.	427	
	6	49	
	Cloudie.	5	
	Obscure.	9	
	Parnassus fayre.	3	

Vpon each Globe there is a table set downe in what forme euery starre of any bignes is made, whereby you may readily know any starre in any Constellation of what bignes it is.

And thus much in brieft for the superficies of the Globe of the Hea-  
uens.

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## TERRESTRIAL GLOBE.

**V**Pon the Globe of the earth is set the picture of the earth, land, and sea, making one perfect round body: and as the Circles (before mentioned) are imagined in the Heauens, so part of them are imagined and drawne vpon the Globe of the earth, as the Equinoctiall, the Meridians and Parallels.

The Globe of the earth is first generall, diuided into five parts, called five Zones: that is, one burnt, two temperate, and two frosen or cold Zones.

The distance betwixt the two Tropicks is called the burnt Zone.

The distance from the tropicke of Cancer to the Circle articke, is called the temperate Zone Northward.

The distance from the tropicke of  $\gamma$  to the Circle antarticke, is called the temperate Zone Southward.

The space of the earth contained within  
the



the two poller Circles, is termed the two frozen Zones.

The earth is reckoned by Longitude and Latitude.

Longitude is numbred in the equinoctiall by meridians from the generall and fixed meridian, into the East, and containeth the whole compasse of the earth, viz. 360 degrees.

The fixed meridian is that meridian, that passeth by the Iland of *Azores*, according to the ancient Cosmographers: yet the same may bee placed in any other place at pleasure.

The reasons, why they did there begin to reckon the Longitude, were two.

First, for that at y<sup>e</sup> time there was no land knowne to the Westward of that place.

The second was for, that vnder that meridian the Needle had no variation, but did point directly North and South.

The Latitude is reckoned from the equinoctiall towards either pole, and is double, that is, Northerne and Southerne Latitude.

Those are said to haue Northerne Latitude, that dwell on the North side of the equinoctiall, and contrary those are said to

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haue Sotherne Latitude that dwell on the South side of the equinoctiall.

The earth is diuided into foure parts, viz.  $\left\{ \begin{array}{l} \text{Europa.} \\ \text{Asia.} \\ \text{Africa.} \\ \text{America.} \end{array} \right.$

Europe is bounded from Asia by the mid-land sea, and *Marymauristane*, by the marches called *Palus meotis*, and by the riuer *Tanis* and *Dwiana*.

The Provinces are these.	1	<i>Germanie.</i>	The principall Islands.	1	<i>England.</i>
	2	<i>Italy.</i>		2	<i>Scotland.</i>
	3	<i>France.</i>		3	<i>Ireland.</i>
	4	<i>Spayne.</i>		4	<i>Sicilia.</i>
	5	<i>Denmarke.</i>		5	<i>Candia.</i>
	6	<i>Norway.</i>		6	<i>Corfica.</i>
	7	<i>Swedeland.</i>		7	<i>Sardigna.</i>
	8	<i>Mosconia.</i>		8	<i>Negroponte.</i>
	9	<i>Polonia.</i>			
	10	<i>Hungaria.</i>			
	11	<i>Clanonia and</i>			
	12	<i>Grecia.</i>			

Asia is bounded from Europe by the riuer *Tanis* and *Dwiana*, from *Afrieke* by the narrow necke of Land betwixt the red sea, and the mid-land sea.

The

The Prouin-  
ces are

{	<i>China.</i>
	<i>Persia.</i>
	<i>Part of Moscovia, and</i>
	<i>Tartaria.</i>

In this part of the world was Paradise and the Land of promise.

*Africa* is bounded with the mid-land sea and the red sea.

{	1 <i>Egypt.</i>	{	1 <i>Madagascat,</i>
	2 <i>Barbaria.</i>		or <i>S. Lorrenyo</i>
	3 <i>Ethiopia.</i>		2 <i>S. Thome.</i>
	4 <i>Nubia.</i>		3 <i>Insule de Ca-</i>
	5 <i>Abasimies.</i>		po verde.
	6 <i>Alonomotopa.</i>		4 <i>Insule de Ca-</i>
			navia.
			5 <i>Insule de Ma-</i>
			dera.

*America* is wholly bounded by the Sea, and the straight of *Magellanus*, and consisteth in two parts, viz.

{	<i>Mexicana.</i>
	<i>Peruana.</i>

*Peruana*

*Pernana* consisteth  
in these Prouinces.

- 1 *Brasilis.*
- 2 *Tisnada.*
- 3 *Caribana.*
- 4 *Cartagena.*
- 5 *Pern.*
- 6 *Charcas.*
- 7 *Chile.*
- 8 *Chicha, and*
- 9 *Patagones.*

*Mexicana*  
consisteth in  
these Pro-  
uinces.

- 1 *Nona Hispania.*
- 2 *Terra Florida.*
- 3 *Nona Albion.*
- 4 *Califorma.*
- 5 *Norumbega.*
- 6 *Nona Francia.*
- 7 *Estotillant.*

*Pernana* chiefe Ilands.

- 1 *Hispaniola.*
- 2 *Cuba, with all the other Ilands of the  
West India.*
- 3 *Margarite Insule.*
- 4 *Molucque Insule.*
- 5 *Remores Insule.*
- 6 *Iana maior.*
- 7 *Iana minor.*
- 8 *Salomonis Insule.*
- 9 *All the other Ilands of East India.*

*Mexicana*

*Mexicana chiefe Ilands.* { 1 *Greenland.*  
2 *Island.*  
3 *Freeſeland.*

The names of the Seas.

- 1 *Ocean Sea.*
- 2 *Narrow Sea.*
- 3 *Mediterraneum Sea.*
- 4 *Mare maior.*
- 5 *Caspium mare.*
- 6 *East Indian Sea.*
- 7 *Red Sea.*
- 8 *Persian Sea.*
- 9 *South Sea.*

And thus much in brieſe for the ſuperficies of the Terreſtriall Globe.

You muſt vnderſtand that the ecliptick is deſcribed vpon ſy terreſtrial Globe aſwel as vpon the Celeſtiall, becauſe that all the conſluſions of the ☉ are as well wrought vpon the Terreſtriall Globe, as by the Celeſtiall, and the ſame furnitur is to be fitted vpon the Terreſtriall Globe that belongeth to the Celeſtiall: and thus much in brieſe for their formes.

Now followeth their uſe: firſt of the Celeſtiall, and next of the Terreſtriall.

FIRST

# FIRST PROPOSITION OF the Celestiall Globe.

*The day of the moneth being given, to  
finde the place of the ☉.*

**V**Pon the Horizon of the Globe is graduated the theoricke of the ☉, that is, there is placed the moneth, and their daies, the signes and their degrees. Therefore finde the day of the moneth, and right against the same you shall finde the signe and degree that the ☉ possesseth.

## Proposition 2.

*The place of the ☉ being given, to finde  
the day of the moneth.*

**F**inde the place of the ☉ in the Horizon, and against the same you shall finde the day of the moneth.

## Proposition 3.

*The place of the ☉ being given, to finde  
the Declination.*

**B**Ring the place of the ☉ to the Meridian of the Globe, and the portion of  
the

the Meridian included betwixt the place of the ☉ and the equinoctiall, sheweth the declination.

**Proposition 4.**

*The place of the ☉ and the Meridian height of the ☉ being given, to finde the height of the Pole.*

**B**Ring the place of the ☉ to the Meridian of the Globe, and from that point account downwards to the Horizon the height of the ☉, and let the ends thereof end in the Horizon: then in the opposite part, you shall finde cut on the Meridian the height of the Pole, that is, the portion of the Meridian included betwixt the Pole and Horizon, sheweth the height of the Pole.

**Proposition 5.**

*To rectifie the Globe fit for use, the elevation of the Pole being knowne.*

**S**Et the poles answerable to the poles of Heauen.

**Pro-**

## Proposition 6.

*To rectifie the quadrant of altitude.*

**S**Et the ioynt thereof vpon the Meridian  
 so farre distant from the equinoctiall,  
 as the poles is eliated about the Horizon,  
 that is, place the ioynt in the Zenith.

## Proposition 7.

*To rectifie the Index of the houre Circle, for  
 any day appointed.*

**B**Ring the place of the ☉ to the Meri-  
 dian of the Globe, and then put the In-  
 dex vpon 12 of the clocke, or vpon that  
 12, which is vppermost from the Horizon.

## Proposition 8.

*The elenation of the Pole and place of the ☉  
 being giuen, to finde the Meridian,  
 height of the ☉.*

**T**He Globe rectified, bring the place of  
 the ☉ to the meridian, and the degrees  
 from the place of the ☉ to the Horizon,  
 sheweth the demaund.

Pro-



Proposition 9.

*The elevation of the Pole and place of the ☉ being given, to find the houre of the ☉ rising.*

**T**He Globe and Index of the houre circle being rectified, bring the place of the ☉ to the East side of the Horizon, and the Index of the houre circle sheweth the houre of the ☉ rising.

Proposition 10.

*The elevation of the Pole and place of the ☉ being given, to finde the houre of the ☉ setting.*

**T**He Globe and Index of the houre circle being rectified, bring the place of the ☉ to the West side of the Globe, and the Index of the houre circle sheweth the houre of the ☉ setting.

Proposition 11.

*The elevation of the Pole and place of the ☉ being given, to finde the length of the day.*

**F**Inde the houre of ☉ setting by the last proposition, and double that time, so haue you the length of the day.

Pro-

## Proposition 12.

*The elevation of the Pole and place of the ☉ being given, to finde the Amplitude.*

**T**Hę Globe rectified, bring the place of the ☉ to the Horizon, and the portion of the Horizon included betwixt the place of the ☉, and the point of East or West, sheweth the amplitude.

## Proposition 13.

*The place of the ☉ and Amplitude being given, to finde the height of the Pole.*

**T**Urne the Globe and moue the Meridian vntill you haue fitted the place of the ☉ in the point of the Amplitude, and then the pole of the Globe sheweth the height of the pole, that is, the place included betwixt the pole of the Globe and the Horizon, sheweth in the Meridian the height thereof.

## Proposition 14.

*The place of the ☉ being given, to finde the right ascension thereof.*

**B**Ring the place of the ☉ to the Meridian, and the degree cut by the Meridian

dian in the Equinoctial, sheweth the right Ascension.

Proposition 15.

*The elevation of the Pole and place of the ☉ being given, to find the crooked Ascension.*

**T**He Globe rectified, bring the place of the ☉ to the East side of the Globe, and the degree cut by the Horizon in the equinoctial, sheweth y<sup>e</sup> crooked Ascension:

Proposition 16.

*To finde the difference of Ascension.*

**F**irst finde the right, and then the crooked Ascension: then take the lesse from the greater, and that rest sheweth the difference of Ascension, except that remainder do exceed 180 degrees, and then that rest taken from 360 degrees, sheweth the difference of Ascension.

Proposition 17.

*By the difference of Ascension, to finde the length of the day.*

**D**ouble the difference of Ascension, & reduce that into time, by allowing 15  
C degrees

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degrees to an houre, and 4 minutes to a degree, and that sheweth the length of the day, longer or shorter then an equinoctiall day: if the ☉ haue declination towards the pole eleuated, then is it longer then an equinoctiall day, but otherwise is shorter.

The equinoctiall day is 12 houres.

Proposition 18.

*The eleuation of the Pole, and declination of the ☉ being knowne, and the height of the ☉ being taken, to finde the houre of the day and Azminth of the ☉.*

**T**He globe Index of houre circle, and quadrant of altitude being rectified, turne the Globe and moue the quadrant of altitude, vntill you haue fitted the place of the ☉ in the Almicanthar, then doth the Index of the houre circle shew the houre, and the quadrant of Altitude sheweth in the Horizon the Azminth.

In this proposition you must consider whether it bee in the forenoone or afternoone: if in the forenoone, put the quadrant on the East side: and if in the afternoone, on the West side of the Globe.

Pro-

Proposition 19.

*The height of the ☉ being given, to finde the  
houre of the day.*

**T**He globe Index and quadrant of altitude being rectified, bring the place of the ☉, vntill it cut the height giuen in the quadrant of altitude, and the Index in the houre circle sheweth the houre.

Proposition 20.

*The houre of the day being giuen, to finde the  
height of the ☉.*

**A**LL things rectified, as in the last Proposition, turne the Globe vntill the Index cut the houre: then bring the quadrant of altitude ouer the place of the ☉, and the degree cut on the quadrant of altitude, sheweth the height of the ☉.

Proposition 21.

*The Azminth of the ☉ being giuen, to finde  
the houre of the day, and height  
of the ☉.*

**A**LL things rectified, put the quadrant of Altitude to the Azminth: then  
C 2                      turne

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turne the Globe, vntill the place of the ☉ touch the edge of the quadrant, then the Index of the houre Circle sheweth the houre, and the degree cut on the quadrant of altitude, sheweth the height of the ☉ at that time.

**Proposition 22.**

*The houre of the day being giuen, to finde the Azminth of the ☉.*

**A**L L things rectified, turne the Index to the houre: then bring the quadrant of Altitude on the place of the ☉, and the end thereof in the Horizon sheweth the Azminth.

OF



## OF THE STARS.

### Proposition 1.

*To finde the Declination of any Starre,*

**V**Orke by the Starre, as you did by the ☉ in the 3. Proposition, viz, An example: *Arcturus* in *Bootes* leggs brought to the Meridian of the Globe, the portion of the Meridian betwixt the place and the equinoctiall, sheweth his declination to be Northerne.

### Proposition 2.

*The meridian height of any starre being giuen, to finde the height of the Pole.*

**V**Orke by the starre, as you did by the ☉ in the 4. Proposition, viz, *Arcturus* meridional height supposed to be giuen 60 degr. then the height of the Pole opposite is found to be 52 degrees.

## Proposition 3.

*To finde the houre of rising of any starre.*

**A**L things rectified, work by the starre, as by the  $\odot$  in the 9. Proposition: for to know at any time the rising of *Arcturus*, or any other \*, you must know in what signe the  $\odot$  is. As for example: The  $\odot$  rising in the 19 degree of  $\gamma$ , which being brought vnder the fixed Meridian, and then the Globe and Index rectified, *Arcturus* is then found to rise at 6 houres, and 30 minutes in the morning, and setteth in the euening at houre 10.30 minutes.

## Proposition 4.

*To finde the houre of any starre setting.*

**A**L things rectified, work by the starre, as by the  $\odot$  in the 10 Proposition, or precedent demonstration.

## Proposition 5.

*To finde the time of any starre above the earth.*

**F**irst finde the houre of rising, and then the houre of setting: the difference of which



which time is the thing required.

*Example.*

*Arcturus* is found by the former Proposition to rise at houre 6.30, which is 5.30 before 12, and hee setteth at 10.30: both which times added together, maketh 16 houres, and so is *Arcturus* found to be 16 houres about the earth.

Proposition 6.

*To finde the amplitude of any starre.*

**W**Orke as by the ☉ in the 12 Proposition. Example: *Arcturus* amplitude is found then, when he is brought to the Horizon; in the side is 37 degrees of Amplitude.

Proposition 7.

*The amplitude of any starre being giuen, to finde the height of the Pole.*

**W**Orke by the \* as by the ☉ in the 13 Proposition. Example: *Arcturus* amplitude being giuen, 37 degrees; the Pole of heauen is found to be 52 degr. about the Horizon eleuated.

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Proposition 8.

*To finde the right Ascention of any  
starre.*

**W**Orke by the starre, as by the Sun  
in the 14 Prop. Example: Bring  
*Arcturus* to the Meridian, and the point in  
the equinoctiall being then vnder the Me-  
ridian, sheweth the right Ascention to be  
209 degrees.

Proposition 9.

*To finde the crooked Ascention of any  
starre.*

**W**Orke by the starre, as you did by  
the Sunne in the 15 Proposition.  
Example: The place of *Arcturus* being  
brought to the Horizon, the degrees of the  
equinoctiall against the Horizon, doe  
proue his crooked Ascention to be 178  
degrees.

Proposition 10.

*To finde the Latitude of any starre.*

**P**Vt the center of the Quadrant of Alti-  
tude, being taken from the Meridian,  
vpon

upon the pole of the eclipticke, *viz.* *Arcturus* Latitude is to be measured from the pole eclipticke with the Quadrant of altitude, and is found to be 31 degr. 30 min. and his Longitude is in 19 degrees of  $\pi$ , to be reckoned with the quadrant of altitude, being brought from the pole eclipticke, to the eclipticke or zodiack, passing right on the place of *Arcturus*.

*Compostella* in *Galicie* is by sundrie matters found to bee in the 43 parallel, which is in Latitude 43. degrees Northward, and in the 11 meridian 30 minutes, which is in Longitude 11 degr.  $\frac{1}{2}$ .

Circles  
of

Latitude or Altitude, beginneth from the equinoctiall by parallels Northward or Southwards, to bee reckoned to 90 degrees.

Longitude to bee reckoned by Meridians numbred in the equinoctiall, which is that meridian passing betweene the equinoctial and the Isles of the Canaries, & are numbred into the East round about  $\frac{1}{2}$  globe, *viz.* to 360 degrees.

One

One houre containeth 15 degrees or 60 minutes, and 4 of those minutes containe one degree: therefore diuiding still your number of minutes by 4, and the quotient shall be degrees.

*Example.*

Twelue minutes of an houre giue three degrees of Longitude, which is 12 min. so that euery minute of an houres time is  $\frac{1}{4}$  part of one degree in Longitude, as is produced by the worke following.

Here followeth the 11 Proposition<sup>r</sup> concerning the Starres.

*Two starres scene in the Horizon to rise or to set at one time, thersby to finde the height of the Pole. Example.*

**T**He two starres rising together, the one is the first starre in *Orions* girdle, and the other \* is that which is in *Pegasus* nose: therefore turne the Globe vntill you fit the said two starres equall with the Horizon in the East: then shall the portion, betwixt the North pole and that Horizon, teach you the poles height to be in 53. degrees.

Pro-

Proposition 12.

*The place of the ☉ and the length of the day being giuen, to finde the height of the Pole.*

**T**He place of the ☉ giuen is in 17 degr. of  $\text{♊}$ , and the length of the day giuen, is 11 houres. Therefore first finde out the right ascension of the ☉, then number frō that place so many meridians, as doe containe the halfe length of the day giuen, and let the end of those degrees rest vnder the fixed meridian: then moue the meridian of the Globe, vntill you fit the place of the ☉ in the Horizon, and then shall you finde vpon the meridian the iust height of the Pole. For example.

The ☉ being in 17. degrees of  $\text{♊}$ , her right ascension is found to be 195 degrees, the daies length giuen is 11: therfore take the one halfe, that is 5 houres  $\frac{1}{2}$ : which time reduced into degrees, *facit* 82 degrees 30 min. the which subtracted out of the ☉ ascension 195, there rest 112 degr. 30 min. which number finde out vpon the equinoctial, and bring it to the fixed meridian, and there keepe the same, vntill by mouing the meridian you do bring the 17 degree of  $\text{♊}$  equall with the Horizon: that done, then  
will

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will the height of the Pole be found eleuated iust 51 degrees.

Proposition 13.

*The length of the day and amplitude of the ☉ being giuen, to finde the height of the Pole, and the ☉ declination.*

**T**He length of the day giuen, is eleuen houres. The amplitude of the ☉ giuen, is 10 degrees. Therefore number from the first meridian Westward, those degrees that haue the length of the giuen day, reduced in degrees doe yeeld, and let the end of those degrees begin in the equinoctiall rest vnder the fixed meridian: then moue the globe vntill you haue fitted y first meridian to cut in the amplitude giuen, and then shal the meridian of the Globe shew the iust height of the Pole. Example.

The length of y day giuen, is 11 houres, whose halfe is  $5\frac{1}{2}$ , the same reduced into degrees, *facit* 28 degr. 30 min. the which taken out of 360 degrees, rest 277 degr. 30 min. the latter point whereof fixe vnder the fixed meridian, there holding the same, vntill by mouing of the fixed meridian, you can bring the giuen amplitude on the East side,

side to fit vpon the first point of the meridian: which done, then shall you finde the Pole eleuated 51 degrees about the Horizon.

PROPOSITIONS THAT ARE  
resolved vpon the Terrestriall Globe.

*That all Propositions concerning the ☉, may  
as well be resolved vpon the Terrestriall  
as the Celestiall Globe.*

Proposition 1.

*To finde the Latitude of any place.*

**B**Ring the place, whose Latitude is required, to the meridian of the Globe, and the portion of the meridian included betweene that place and the equinoctiall, sheweth the Latitude.

*And so are the following places in Latitude Northward.*

London	51.4.30.m.
Hamborough.	54.
Amsterdam	52.full.
Antwerpe.	51.scarse.
Bolloigne.	48.30.
Paris.	48.30.

*Lions.*

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<i>Lyons.</i>	46.
<i>Bordeaux.</i>	43.40.
<i>S. Ander.</i>	42.30.
<i>The Groyne.</i>	43.
<i>Lisborne.</i>	39.30.
<i>Seuill.</i>	37.30.
<i>Cape-Martin</i>	39.40.
<i>Genoa.</i>	45.
<i>Roma.</i>	42.
<i>Naples.</i>	41.
<i>Palermo.</i>	37.30.
<i>Venice.</i>	46.
<i>Ragusi.</i>	42.
<i>Cyprus.</i>	37.15.
<i>Rhodus,</i>	38.
<i>Ierusalem.</i>	34.40.
<i>Teneriffe.</i>	28.30.
<i>Capo-blanco.</i>	30.
<i>Isla S. Helena.</i>	16.40. Southward.
<i>Nombre de dios.</i>	9. Northward.
<i>Panama.</i>	8.
<i>Capodenela.</i>	10.
<i>Havana.</i>	22.
<i>San Domingo.</i>	17.30.
<i>Isle Iouis.</i>	66.
<i>Fane Insule.</i>	64.30.
<i>Islandie.</i>	67.30.
<i>Gibraltar.</i>	35.



Proposition 2.

*To finde the Longitude of any place.*

**B**Ring the place appointed to the meridian of the Globe, and the degrees cut by the meridian in the equinoctiall, sheweth the Longitude.

And so are the places here vnder found in longitude, viz.

<i>London.</i>	<i>20.30. longitude.</i>
<i>Hamborough.</i>	<i>33.30.</i>
<i>Antwerpe</i>	<i>26.30.</i>
<i>Paris.</i>	<i>24.</i>
<i>Bordeaux.</i>	<i>22.</i>
<i>S. Ander.</i>	<i>18.30.</i>
<i>The Grayne.</i>	<i>13.</i>
<i>Lisbona.</i>	<i>13.</i>
<i>Senill.</i>	<i>17. degrees.</i>
<i>Genoa.</i>	<i>35.</i>
<i>Roma.</i>	<i>37.</i>
<i>Venice.</i>	<i>40.</i>
<i>Palermo.</i>	<i>37.30.</i>
<i>Ierusalem.</i>	<i>69.</i>
<i>San Domingo</i>	<i>in the West Indies. 310.</i>
<i>Teneriffe.</i>	<i>3. degr. 30.</i>
<i>Palona.</i>	<i>1. degr. longitude.</i>

Pro-

## Proposition 3.

*To finde the difference betweene any two places upon the Globe.*

**T**AKE the distance with a paire of compasses, and apply the same to the equinoctiall, accounting for euery degree 60 miles, or 20 leagues, or according to that countrey wherein you are.

And so are the distances betweene

London and	{	<i>Ierusalem</i>	39.	<i>facit</i>	795.	<i>leagues.</i>
		<i>Antwerpe</i>	3.30.	<i>facit</i>	70.	
		<i>Paris.</i>	4.20.	<i>facit</i>	86. $\frac{2}{3}$ .	
		<i>Venice</i>	13.40.	<i>facit</i>	273. $\frac{1}{3}$ .	
		<i>Bordeaux</i>	8.00.	<i>facit</i>	170.	
		<i>Lisbona</i>	13. $\frac{2}{3}$ .	<i>facit</i>	273.	
		<i>Senill</i>	14. $\frac{1}{4}$ .	<i>facit</i>	295.	
		<i>Roma</i>	16. $\frac{1}{2}$ .	<i>facit</i>	330	<i>leagues.</i>
		<i>Teneriffe</i>	27.00.	<i>facit</i>	540.	
		<i>Terra nona</i>	28.00.	<i>facit</i>	560.	

## Proposition 4.

*The Latitude and Longitude of any place being given, to finde the same upon the Globe.*

**B**RING the Latitude of that place to the Meridian of the Globe, and vnder the

the Meridian in the Latitude, shall the place required be found.

By the first and second Proposition is this Proposition resolved.

Proposition 5.

*To finde the Antipodes to any place.*

**B**Ring the place appointed to the Meridian, and note the Latitude: then in the opposite degree of Latitude vnder the Meridian, you shall finde the point of Antipodes.

And after this sort are those Antipodes to *London*, that dwell 51 degrees  $\frac{1}{2}$  Latitude, and in 198 degrees Longitude in the South-maine.

And to *Seuill*, those that dwell in 37 degrees, 30 min. Latitude, and 196 degr. Longitude, are Antipodes.

And to *Lisbone*, those that dwell in 39 degr. 30 min. Latitude, and 192 deg.  $\frac{1}{2}$  Longitude, are Antipodes.

And to *Amsterpe*, those that dwell in 51 degr. Latitude, and 195 deg. Longitude in the said South-maine.

The people dwelling vnder the North and South pole, and vnder the Eclipticke

D

poles,

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poles, are Antipodes the one to the other.

Those of *Cusco* in *America*, are Antipodes to those of *Narsinga* in *East India*.

Those of *Lyma* and *Calicut*, are Antipodes to each other.

The *Insulanes* of *Serrana* and *Iona*, are Antipodes to each other.

Those of *Xalisco*, *Colinia*, *Guatatan*, *Petratlan*, *Gnaxaca*, &c. are Antipodes, to the *Insulanes* of *S. Lawrence*.

Those of *Malaca* are Antipodes to that people dwelling in the province of *Omagua*.

Proposition 6.

*To finde the difference of time betweene any two places.*

**B**Ring the Eastermost place to the Meridian, and rectifie the Index: then bring the second place also to the Meridian, and marke where the Index cuts, it sheweth the houre at that second place, whē it is noone at the first. Or to doe this more precisely, finde the difference of the Longitude betwixt these two places: which remainder reduce into time, by allowing 15 degr. for an houre, and the difference is found.

Pro-

Proposition 7.

*To finde the difference of the longest day betweene any two places.*

**F**Inde the length of the day at each place, by the Proposition before taught, and the difference betweene them is found by their severall lengths.

First it is to be noted, in Northen Latitude the longest day of the yeare is, when the ☉ is in the first point of ☊, and therefore according to that place is the longest daies of severall places here vnder set down, the which precisely have been calculated, by the difference of Ascension, that the ☉ made at one same time in severall places.

*London* lying in the Latitude of 51 deg. 30 m. and the place of the ☉ taken in the first degree of ☊, had right Ascension 90 degrees, and crooked Ascension 58 deg.

*Lisbona* Latitude 39.30, makes 10 deg. difference of Ascension: which doubled, *facit* 40 deg. those reduced into time, *facit* 2 houres 40 min. those added to 12, *facit* 14 houres, 40 min. for the longest day.

*Genoa* Latitude 45 degrees, the ☉ right Ascension is 90 degrees, the crooked 68,

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the difference is 22 : which doubled is 44, which make 2 houres 56 min. of time: those added to 12 houres, make 14 houres 56 m. for the longest day.

*Roma* Latitude 42 hath the same difference of Ascension of the ☉, and therefore their longest day is equall with those of *Genoa* 14 houres 56 min.

*Naples* Latitude 41 degr. right Ascension 90, crooked 64. 30, and the difference thereof *facit* 48 degrees, 2 houres, 54 min. which added, *facit* 14 houres, 54 min.

*Venice* Latitude 46 degr. right Ascension 90, crooked 64. 30. and the difference thereof is 51 degr. *facit* 3 houres, 24 min. which added, *facit* 15 houres, 24 min.

*Candia* Latitude 27 degr. in that place, and on the same day make the ☉ 18 degr. difference of Ascension : which doubled, *facit* 36, which is 2 houres, 24 min. of time: which added to 12 houres, *facit* 14 houres, 24 min. for their longest day.

*Rhodes* in Latitude 38 degr. *facit* difference 19 degr. doubled 38, *facit* 2 houres, 32 min. which added, make 14 houres 32 min. for their longest day.

At *Ierusalem* Latitude 34 degr. 40 min. when the ☉ is in the first degree of ♈, he differeth

differeth in Ascension 17 degr. which doubled, *facit* 34 degr. the which make of time, 2 houres 16 minutes, which added to 12 houres, *facit* 14 houres, 16 min. for the longest day.

In *Teneriffe* Iland in the Latitude of 28 degr. 30 min. in the same time the ☉ doth differ in Ascension 12 deg.  $\frac{1}{4}$ : which doubled maketh 25 degrees, which make of time one houre 40 minutes: those added to 12 houres, *facit* 13 deg. 40 min. for the longest day.

*Cape-blanc* lying in 20 deg. Latitude, in the same time the ☉ hath right Ascension 90 degr. and crooked 42, rest 8 of difference, which doubled, *facit* 16 degr. and of time one houre 4 min. which added to 12, *facit* 13 houres 4 min. for the longest day.

*Panama* Ilands 8. degr. Latitude right Ascension 96 degr. crooked 87 degr. so is there difference 3 degrees: which doubled, makes 6. degrees, and 24. min. of time: so is their longest day in the yeere 12 houres, 24 minutes.

*Southerne Ilands*, scituated vnder the line Equinoctiall, there maketh the ☉ no difference of Ascension, and therefore the day

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is alwaies of 12 houres long, but winter or sommer the ☉ declineth North or Southward.

*Capo de vela* in the West Indies in 12 degrees of Latitude, at the same time when the ☉ is in the first degree of ♊, hath 90 degrees right Ascension, and crooked 85 diff. is 5, which doubled is 10 min. which reduced make 40 min. of time, which added to 12 houres, sheweth their longest day to be 12 houres, 40 min.

*Hanana* at the same time differeth the ☉ in Ascension 9 degr. 30 minutes, double makes 19, which is time one houre, 16 min. which added to 12, maketh 13 houres, 16 min. for their longest day.

*San Domingo* Iland maketh the ☉ 7 degrees  $\frac{1}{2}$  for difference of Ascension: which doubled, maketh 15: is one houre time, so is their longest day 13 houres.

*Faire Iland* in 64 deg. of Latitude the ☉ hath at the same time 90 deg. right Ascension, crooked 30, rest 60 for difference thereof, which doubled, *facit* 120 degrees, which maketh time 8 houres, those added to 12 houres, sheweth that the longest day there is 20 houres.

At *Icaria* Iland in 66 degrees Latitude, the



the ☉ being in the first degree of ☊, hath 90 degr. right Ascentiō, crooked 20, which difference is 70: those doubled, maketh 140 degr. which is 9 houres, 20 m. of time, so is their longest day of the yeere 21<sup>h</sup>. 20 minutes.

*Island* in 67 degr. Latitude on the same time hath crooked Ascention 8 deg. which taken from 90, differeth 82 degrees, which doubled, are 164 degr. which reduced into time, doe giue 10 houres, 56 min. and those added to the equinoctiall day, *facit* 22<sup>h</sup>. 56 min. for the longest day in the yeere.

These differences of Ascention is more precisely found by proiecting the figures, and then by scale and Compasse, and yet more precisely by Arithmetically calculation, by which the said difference and length of daies are found,

14<sup>h</sup>. 20. min. *Ierusalem.* 17. 30.

13. 48<sup>d</sup>. 56 min. *Teneriffe.* 13. 37.

13. 12<sup>d</sup>. 56 min. *Capo-blanco.* 9. 7.

12. 32. *Nombre de dios.* 4.

12. 28. *Panama.* 3. 30.

12. — *San Thome* being vnder the equinoctial, the ☉ maketh no difference, and therefore alwaies 12 houres.

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12. 42. —	Capo de vela	5. 15.
13. 20. 48.m.	Hauana.	10. 6.
13. 3. 4m.	San Domingo.	7. 53.
20. 44. 40m.	Fane Infula.	65. 35.
22. 9. 20m.	Icari Infula.	76. 10.

## Proposition 8.

*To finde the Horizontall position and difference betwixt any two places.*

**F**irst rectifie the Globe for that place, from the which you would know the Horizontall position and distance to the other place: bring also that first place to the Meridian of the Globe, then put the quadrant of Altitude on the Zenith, there let the Globe rest, then bring the quadrant of Altitude over the two places, and the degrees cut by the end of the quadrant in the Horizon, sheweth the Horizontall position, and the degree cut by the second place in the quadrant, account from the Center downwards, sheweth the distance.

For example.

The bearing of *Ierusalem* to *London* is 50 degr. accounted from the North point Westward, and the distance is 38 degr. 30 minutes,

minutes. And from *London* to *Ierusalem* the bearing is 85 degrees, accounting from the South point Eastward, and the distance is as before.

Now to finde the Rhombe, adde the two Horizontall positions together, and the one halfe thereof sheweth it.

From *Ierusalem* to *Aleppo*, the bearing is 69 degrees from the North point Westward, the distance is 43 degr.  $\frac{1}{2}$ : and *Aleppo* beareth to *Ierusalem* 77 degrees from the North point Eastward.

*Ierusalem* to *Teneriffe* beareth 77 degr. from the North point Westward; and *Teneriffe* to *Ierusalem* 64 degrees, accounting from the North point Eastwards; and the distance betwixt the two places is 55 degrees  $\frac{1}{2}$ .

*Ierusalem* to *Rome* beareth 67 degr. from the North point Westward, distance 24.  $\frac{1}{2}$ : *Rome* to *Ierusalem* 86 degr. from the South point Westward.

*Ierusalem* to *Gibaltare* beareth 76 degr. from the North point Westward, and the distance is 43 degr. and *Gibaltare* to *Ierusalem* beareth 73 degrees from the North point Eastward.



## OF THE WORLD.

**T**He world is diuided into two parts,  
*viz.* Elementall, and Etheriall parts.

The first is subiect to daily alterations,  
 and containeth foure Elements: that is,  
 the Earth, the Water, the Aire, and the  
 Fire.

An element is that, whereof any thing is  
 compounded, and of it selfe not compoun-  
 ded; of these foure elemēts, any part of any  
 kinde is named for the whole, as any part  
 of the earth is called the earth.

The Etheriall parts doth compasse the  
 elementall parts in the concauitie thereof,  
 and containeth 10 Spheres: whereof the  
 first is the sphere of the *Moone*, and is next  
 vnto vs. The second is *Mercurius*: the  
 third *Venus*: the fourth *Sol*: the fifth *Mars*:  
 the sixth, *Iupiter*: the seuenth, *Saturnus*:  
 the eighth sphere is the starrie firmament:  
 the ninth is the Christaline heauen: The  
 tenth, *Primum mobile*, which doth containe  
 all the rest within it, and whatsoeuer is be-  
 yond

yond or aboue that, is the habitation of God and his Angels.

The reason how these spheres were first found out, were their contrarie motions in the heauens, obserued by the ancient learned Astronomers, and we finde that by our owne obseruations, as thus, viz.

First, all things in the heauens turne about the earth, vpon the poles of heauen in foure and twentie houres, and these motions are from the East into the West, and this wee attribute to the motion of the 10 sphere, or *Primum mobile*, without staying, being so appointed by God frō the beginning, and carrieth about with him in violence all the other spheres.

All the rest of the spheres haue contrarie motions, euery one in his kinde, though farre slower then the other, and their motions is contrary from the West to the East, and so are carried about often times by the first mouer, before they make one perfect reuolution in themselves.

The Christaline or ninth sphere his motion is almost vn sensible, and is called the trembling motion, and is performed, according to *Ptolomie* his opinion, in 36000 yeeres, but by the opinion of others in a farre

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farre longer time, as in 49000. yeeres.

The eighth sphere, being the starrie firmament, performeth his motion in 7000 yeeres.

The rest of the spheres are the seven Planets, each sphere containeth in it but one starre, whereof the vppermost and slowest is *Saturne*, which performeth his course in 24 yeeres, 162 daies, and 12 houres.

*Iupiter* performeth in 11. yeeres, 133 daies, and 23 houres.

*Mars* performeth in 322 daies, and 23 houres.

*Sol* performeth in 365 daies & 6 houres, which is one whole yeere.

*Venus* in 385 daies, 9 houres, performeth her course.

*Mercurie* performeth as the ☉ in 365 daies, and 6 houres.

*Luna* performeth her course once euerie 27 daies, and 12 houres.

THE

THE CHARACTERS OF THE  
Planets are these following.

*Saturne* ♄ *Mars* ♂ *Venus* ♀  
*Jupiter* ♃ *Sol* ☉ *Mercurie* ☿ *Luna* ☾

**T**Here are points mouable in the Eclip-  
ticke, which are called the Dragons  
head, and the Dragons taile, and their ca-  
racters are these: Dragons head ♄, Dra-  
gons taile ☿.

The Dragons head is the point in the E-  
clipticke, which the ☾ toucheth, when she  
crosseth the Eclipticke, and passeth to the  
Northwards of it.

The ☿ is the point in the Eclipticke,  
where the ☾ passeth by, when she crosseth  
the Ecliptick, & passeth by it to the South,  
and these two points are opposite the one  
to the other.

*To*

*To know how the Planets reigne every houre  
of the day, and night : beginning  
with Saturday.*

**Houres of the day.**

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
Sat.	H.	4.	♂.	♂.	♀.	♀.	♂.	H.	4.	♂.	♂.	♀.
	♂.	♀.	♀.	♂.	H.	4.	♂.	♂.	♀.	♀.	♂.	H.
	♂.	H.	4.	♂.	♂.	♀.	♀.	♂.	H.	4.	♂.	♂.
	♂.	♂.	♀.	♀.	♂.	H.	4.	♂.	♂.	♀.	♀.	♂.
	♀.	♂.	H.	4.	♂.	♂.	♀.	♀.	♂.	H.	4.	♂.
	4.	♂.	♂.	♀.	♀.	♂.	H.	4.	♂.	♂.	♀.	♀.
	♀.	♀.	♂.	H.	4.	♂.	♂.	♀.	♀.	♂.	H.	4.

**Houres of the night.**

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
Sat.	♀	♂	♂	♂	♂	♀	♀	♂	♂	♂	♂	♂
	♂	♂	♂	♀	♀	♂	♂	♂	♂	♀	♀	♀
	♀	♀	♂	♂	♂	♂	♂	♀	♀	♂	♂	♂
	♂	♂	♂	♂	♀	♀	♂	♂	♂	♂	♂	♀
	♂	♀	♀	♂	♂	♂	♂	♀	♀	♂	♂	♂
	♂	♂	♂	♂	♂	♀	♀	♂	♂	♂	♂	♂
	♂	♂	♀	♀	♂	♂	♂	♀	♀	♂	♂	♂

**FINIS.**



